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ABSTRACT

A mail survey of a random sample of 253 West Virginia teachers elicited information related to subjects' backgrounds, telecommunications skills, access to computer resources, preferences among common telecommunications applications, and preferences among options for learning about telecommunications. Four scales measured computer literacy, telecommunications literacy, interest in telecommunications for instruction, and interest in telecommunications for professional development. The mean age of respondents was 42.7, with an average of 17.6 years teaching experience. Teachers exhibited a higher level of computer literacy than telecommunications literacy, with 62% reporting themselves proficient with word processing software. More than half the respondents had computers at home and 68% reported access in the classroom. Few had access to a modem, and only about 15% had phone jacks in their classrooms. Respondents were more interested in instructional applications than in professional development applications of telecommunications. The preferred means of learning about telecommunications was assistance from colleagues, with workshops and conferences ranked next. Data is presented in eleven tables and an appendix contains the survey. Contains two references. (SLD)

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West Virginia Teachers' Telecommunications Needs and Preferences: Initial Results of a Survey

A Report to the National Science Foundation

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Marshall University, Huntington, WV

January 13, 1994

IR016948

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

EXECUTIVE SUMMARY

A mail survey of a random sample of West Virginia teachers (n = 253) elicited information relevant to subjects' backgrounds, telecommunications skills, access to computer resources, preferences among common telecommunications applications (for instruction and for professional development), and preferences among options for learning about telecommunications. The survey instrument was developed in consultation with telecommunications experts, pilot-tested, and revised before its use with the survey sample. The survey developed four scales to measure computer literacy, telecommunications literacy, interest in telecommunications for instruction, and interest in telecommunications for professional development. Alpha reliabilities for the four scales of seven items each ranged from .87 to .93.

Background of sample. Respondents' mean age was 42.7, with an average of 17.6 years teaching experience; 26.5 percent were male and 73.5 percent female. By grade level, 38.4 percent taught grades K-4, 32.4 percent grades 5-8, and 29.2 percent grades 9-12. Approximately half reported teaching in communities of low socioeconomic status.

Technological literacy. Teachers exhibited a higher level of computer literacy than telecommunications literacy, and the analysis suggested that a high level of computer literacy is probably antecedent to telecommunications literacy. West

Virginia teachers were very familiar with popular computer applications such as wordprocessing and database management software. They were less familiar with other applications, but those who were familiar with telecommunications tended to use more applications with greater ease than their colleagues. For instance, of the full sample, 62 percent reported proficiency with wordprocessing software, but only 18 percent reported proficiency in the use of modems.

Computer access. More than half the teachers in this sample (58 percent) reported that they had access to computers at home and 68 percent reported access in their classrooms. However, only 17 percent had access to a modem at home and only 9 percent reported such access in their classrooms. Approximately twice that number (15 percent) indicated the presence of phone-jacks in their classrooms. Additional analyses indicated that high-end home computer users (those with a hard-disk drive and/or modem) were less common than chance would predict at the K-4 level and more common than chance would predict at the 5-12 level.

Preferences among applications. Respondents indicated overall higher interest in the instructional as compared to the professional development applications of telecommunications (based on the means of two scales developed to measure such interest). Teachers' greatest interest in using telecommunications instructionally was to help students get information for class projects. Their greatest professional development interest was in electronic access to full-text

documents. The two instructional applications rejected by the largest proportion of teachers (about 10 percent in each case) concerned electronic pen-pals and collaborative projects. No professional development applications were rejected by more than 10 percent of respondents. At least 15 percent of teachers did express lack of sufficient knowledge to make a judgment on nine possible applications of telecommunications (eight of the nine were professional development applications).

There were three statistically significant differences in preference for applications by grade level, and all pertained to instructional applications. Teachers in grades K-4 viewed student access to remote computers for analysis or simulation activities as less desirable than other teachers; 9-12 teachers viewed establishing pen-pal relationships and providing an avenue for publishing student work as less desirable than other teachers.

Preferences among options for learning about telecommunications. Among all teachers, the most highly rated option for learning more about telecommunications was assistance from colleagues. Eighty-four percent of respondents gave "colleagues" the highest rankings (a "1" or "2" on a 5-point scale, with "1" the highest rating). Workshops and classroom consultants were next most preferred (given ratings of "1" or "2" by 74 and 72 percent of respondents, respectively). The learning option rated lowest was independent reading and practice, with 47 percent of respondents assigning the two highest ratings.

There were no statistically significant differences among ratings of options by grade level. One difference did appear among subject groups (the only teachers so classified were those in grades 5-12). Analysis of variance results, showed that math/science/technology teachers were less receptive to independent reading and practice (mean of 2.1) than other teachers (mean of 2.6).

Conclusions. West Virginia teachers exhibit a considerable degree of computer literacy and have substantial access to computers at home and at school. The degree of telecommunications literacy is less, but the respondents to this survey clearly indicate their desire to become telecommunications users: They are clear about their preferences for applications and for ways to learn more about telecommunications.

BACKGROUND

In the near future, telecommunications will provide K-12 schools with a wealth of resources and instructional opportunities. Currently, these resources and opportunities are available but only to a limited degree. Depending on a variety of contextual factors, schools may or may not have access to telecommunications networks at this time. And commercial networks are expensive. Increasingly, states are looking to the Internet as a less expensive and more versatile alternative to commercial telecommunications networks.

As K-12 educators examine this option, however, they inevitably confront difficulties related to connectivity and even more daunting ones related to end-user comfort. Unless teachers and other educators learn how to access the Internet with relative ease, they will make little use of the resources available.

Yet there is not much information about how teachers in general regard this technology and its possibilities. The one national survey (Honey & Henríquez, 1993) of teachers' use of the Internet and other telecommunications networks focused on the activities and preferences of teachers who already make use of this technology. Other surveys of Internet use (e.g., Bauer, 1993) are more general, focusing on the characteristics and interests of current users, the largest contingent of whom (42

percent, according to Bauer) are university students, not teachers in K-12 schools. Most public school teachers have had quite limited exposure to telecommunication technologies though they constitute a large group of potential users. Information about these teachers' skills, attitudes, and interests with regard to networking is needed to guide efforts aimed at disseminating this new instructional technology.

The purpose of this study was to provide just such information to educators and policy makers in West Virginia who are looking at ways to increase K-12 Internet accessibility and use. In particular, the study aimed to answer the following questions:

(1) What computer and telecommunications skills do West Virginia teachers already have?

(2) What classroom and professional development applications of telecommunications do West Virginia teachers believe will be most useful?

(3) What resources are available in the homes, classrooms, and schools of West Virginia teachers to support telecommunications networking?

(4) Through what channels would West Virginia teachers prefer to learn about telecommunications applications?

(5) What background variables contribute to West Virginia teachers' receptivity to using telecommunications technologies?

METHODS

The researchers constructed a survey instrument (Appendix A) and mailed it to a random sample of 850 West Virginia teachers. Ten days after mailing the survey, we sent a follow-up postcard to remind teachers to complete and return the survey. We allowed fourteen additional days for teachers to respond, then began analyzing data from the 253 usable surveys (a 30% return rate) that had been received by that time.

Sample

The researchers requested that personnel from the West Virginia Department of Education draw a random sample of teachers from the most recent (i.e., 1992-93) data files. In that school year West Virginia had a population of 20,271 teachers. Provided that all teachers returned the survey, a sample of approximately 400 would have been sufficient to assure 95% sampling confidence. However, because we anticipated an average return rate (between 30-50%) and because we wanted to analyze the responses of math and science teachers separately, we more than doubled the sample size. Despite our efforts (i.e., oversampling and sending a follow-up postcard), our return rate was lower than we would have liked. As a consequence, our results need to be interpreted cautiously. It is possible that the sample reflects certain systematic biases. For example, those teachers who are interested in instructional technologies may have been more likely than others to return their surveys.

Instrumentation

We developed a survey instrument to elicit information pertinent to the questions posed. We were particularly concerned to include items that could be used to construct scales to measure factors related to teachers' technological literacy and to their interests in the applications of telecommunications.

Survey construction proceeded in four stages. At the first stage, we developed a draft of the instrument and mailed it to 11 reviewers, including six experts on telecommunications networking, two specialists from the West Virginia Department of Education, one classroom teacher with networking expertise, one teacher educator, and one math-science education specialist from a Regional Educational Laboratory. At the second stage, we revised the instrument, responding to the concerns of the eight reviewers who provided commentary, and we field-tested the instrument with a pilot group of 38 West Virginia teachers. At the third stage, we again revised the instrument based on our analyses of the responses obtained in the pilot study, omitting items that were redundant and clarifying items that confused respondents. We did not select items for the various scales during pilot testing, preferring instead to construct the scales post-hoc on the basis of the data obtained from the much larger study sample.

In the final stage, using the 253 usable responses to the survey, we constructed four scales to measure aspects of teachers' technological literacy and interest in

telecommunications. To identify these factors, we first performed a factor analysis on all items developed to assess teachers' technological literacy and then one on all items developed to assess teachers' interest in telecommunications applications.

The factor analysis on items relating to technological literacy disclosed two distinct but moderately related factors, which we named "computer literacy" and "telecommunications literacy." The factor analysis on items relating to teachers' interest also revealed two factors, which we termed "interest in instructional applications" and "interest in professional development applications."

To construct each of the scales, we used the following procedure: (1) we selected items that had factor loadings of .50 and above on the relevant factor, (2) using these items, we computed alpha reliabilities for a scale of items thus selected, and (3) we removed items that contributed least to the reliability. Our goal was to develop four scales (one relating to each of the four factors), each with the same number of items, yet each maintaining a high alpha reliability. Each final scale contained seven items, with the alpha reliabilities given in Table 2.

Table 2

Alpha Reliabilities for Technological Literacy and Interest Scales

Scale	Alpha
computer literacy	.87
telecommunications literacy	.88
instructional applications	.93
professional development applications	.92

Total scores were computed for each scale. These scores provided summative measures of respondents' computer literacy (COMPLIT), telecommunications literacy (TELELIT), interest in instructional applications in the classroom (INSTRUCT), and interest in professional development applications (PROFDEV).

RESULTS

For the most part, this section presents descriptive statistics to answer the five questions the researchers posed. Analysis of variance was used to test for differences by gender, level taught, community socioeconomic status, and high versus low computer usage.

Technological Skills of West Virginia Teachers

Two scales measured the self-reported technological skills of West Virginia teachers, computer literacy and telecommunications literacy. In each instance, respondents were asked to rate their familiarity, on a 1 (low) to 5 (high) Likert scale, with a variety of computer or telecommunications applications. Each of these two scales contained seven items, so COMPLIT and TELELIT values could vary from a minimum of 7 to a maximum of 35. For each scale, respondents' actual scores reflected the full possible range. Two items among those related to teachers technological skills loaded heavily on both the computer and telecommunications literacy scales and were retained in each in accord with the procedure described above.

Computer literacy. The seven items comprising the computer literacy scale asked respondents about their familiarity with (1) microcomputers, (2) modems, (3) CD-ROM, (4) wordprocessing software, (5) database management software, (6) statistical analysis software, and (7) desktop publishing software. The mean score was 18.8, with a standard deviation of 6.9. COMPLIT values were normally distributed.

Table 3 reports the percentages of respondents who gave high ratings, that is, ratings of 4 ("some independent use") and 5 ("frequent independent use") on these seven items.

Table 3

Computer Literacy
Percentage of Respondents Providing Ratings of 4 or 5 on Each Item

Item	percentage
wordprocessing	62.1
microcomputers	43.9
desktop publishing	29.0
database management	28.3
CD-ROM	27.5
modems	17.7
statistical analysis	14.6

Telecommunications literacy. The two items among those related to teachers' technological skills that loaded heavily on both the "computer literacy" factor and the "telecommunications literacy" factor were familiarity with (1) modems and (2) statistical analysis software. The other items on the telecommunications scale (TELELIT) assessed respondents' familiarity with (1) accounting software, (2) computer-assisted design, (3) the Internet, (4) commercial telecommunications networks, and (5) independent bulletin board services.

The mean value on TELELIT was 12.6 and the standard deviation was 5.6; the distribution showed strong positive skewness (many more low than high scores), reflecting the possibility that telecommunications literacy is a form of high-level computer literacy. The median score was 11.0.

Table 4 reports, for all seven items contributing to the TELELIT score, the percentages of respondents who rated each item 4 ("some independent use") or 5 ("frequent independent use").

Table 4

Telecommunications Literacy
Percentage of Respondents Providing Ratings of 4 or 5 on Each Item

Item	percentage
modems	17.7
statistical analysis	14.6
accounting	14.6
computer-assisted design	10.2
bulletin board services	7.7
commercial networks	6.0
Internet	4.4

Other items. In addition to the preceding items grouped by factor analysis into scales, the survey collected information related to other aspects of technological skills. Table 5 reports the comparable frequencies for the items not included in either of the preceding two scales.

Table 5

Technological Skill Items Not Included in Scales
Percentage of Respondents Providing Ratings of 4 or 5 on Each Item

Item	percentage
instruction (computer-assisted)	47.2
mainframe computers	20.9
programming languages	20.6

Preferences for Applications of Telecommunications

Teacher preferences for applications were divided between items concerned with instruction and those concerned with professional development. Among these items seven each were selected to create two scales. This section reports results for scales, for scale items, and for items not on either scale.

Interest in instructional applications. Seven items comprised the scale related to the factor the researchers called "interest in instructional applications" (INSTRUCT). These items concerned the desirability of using telecommunications to help students (1) establish electronic "pen-pals," (2) conduct collaborative projects with distant peers, (3) obtain information for class projects, (4) establish relationships with expert mentors, (5) participate in electronic discussion groups, (6) publish their work, and (7) articulate positions on matters of public interest.

Values of INSTRUCT ranged from 0 to 35, reflecting the full range possible, and its mean value was 23.6 with a standard deviation of 9.2. The distribution exhibited moderate negative skewness (with the median at 25.5), indicating respondents' tendency to give more high ratings than low ratings to these items. This tendency is not surprising and characterizes the PROFDEV scores as well: Respondents expressed overall desire for extant (but largely inaccessible) services.

Items comprising this scale, together with the percentage of the sample giving high ratings, that is, ratings of 4 ("desirable") or 5 ("very desirable") are provided in Table 6.

Table 6

Preferences for Classroom Applications of Telecommunications
Percentage of Respondents Providing Ratings of 4 or 5 on
Each Item

application	percentages
information	69.0
voice on public issues	59.2
mentors	54.8
electronic discussions	53.3
publication	52.4
collaborative projects	47.7
pen-pals	47.0

Interest in professional development applications. Seven items comprised the scale related to the factor the researchers called "interest in professional development applications" (PROFDEV), as follows: (1) consultation with experts and scholars, (2) electronic access to libraries, (3) electronic discussions, (4) electronic access to journals, (5) access to electronic full-text materials, (6) access to software and other nonprint media, (7) participation in electronic conferences.

Values of INSTRUCT ranged from 0 to 35, reflecting the full range possible, and its mean value was 21.2 with a standard deviation of 10.6. The distribution exhibited moderate negative skewness (with the median at 24.0), which was less pronounced than for INSTRUCT. That is, teachers--for whatever reason--tended to view the provision of instructional applications more favorably than they did the provision of professional development applications.

Items comprising this scale, together with the percentage of the sample giving ratings of 4 ("desirable") or 5 ("very desirable") are provided in Table 7.

Other items. Comparable information about items not included in either applications scale is provided in Table 8.

Table 7

Preferences for Professional Development Applications of Telecommunications: Percentage of Respondents Providing Ratings of 4 or 5 on Each Item

application	percentages
full-text materials	60.8
electronic libraries	52.4
nonprint materials	50.8
consultation with experts	50.2
electronic conferences	47.6
electronic journals	46.4
electronic discussions	38.4

Table 8

Preferences for Applications of Telecommunications Not Included in Applications Scales: Percentage of Respondents Providing Ratings of 4 or 5 on Each Item

application	percentages
analysis, simulation on remote computers (for students)	45.0
access to ERIC database	38.3
electronic mail	36.6

Low-rated application items. It is also useful to know which application items were rated low by teachers. Two application items--both pertaining to students--were rated as 1 "not acceptable" or 2 "not desirable" by at least 10 percent of respondents (all pertained to students): pen-pals (10.1%) and collaborative projects (11.3%). In addition, 9.7 percent of teachers rated student access to mentors as a "1" or "2."

Application Items about which teachers expressed lack of knowledge. Among the following items, at least 15 percent of respondents reported they did not know enough to state a preferences:

- o electronic access to ERIC resources (41.1%),
- o electronic mail (26.9%),
- o electronic discussion groups for teachers (26.1%),
- o electronic access to nonprint materials (23.0%),
- o electronic conferences for teachers (21.8%),
- o electronic journals (19.4%),
- o electronic access to libraries (19.0%),
- o electronic access to full-text resources (18.5%), and
- o student access to remote computers for analyses or simulations (17.8%).

Differences in preference by instructional level. Oneway analyses of variance were conducted (following tests for homogeneity of variance) on the means of all items related to applications, whether for instructional or professional development purposes. Several statistically significant

differences were discovered:

- Teachers in grades K-4 (not surprisingly) viewed student access to remote computers for analysis or simulations as less desirable than teachers in grades 5-12 (means of 2.7 versus 3.2, $p < .05$).

- Teachers in grades 9-12 (also not surprisingly) viewed the use of telecommunications to establish pen-pal relationships as less desirable than teachers in grades K-8 (means of 2.8 versus 3.3, $p < .01$).

- Teachers in grades 9-12 viewed the use of telecommunications to publish student work as less desirable than teachers in grades K-8 (means of 3.0 versus 3.5, $p < .01$).

Resource Availability

The researchers posed a series of 13 items to elicit information about teachers' access to computer resources at home and at school. For these items, respondents were asked to place a check-mark in boxes if they had access and to leave the item blank if they did not.

For home resources, respondents were asked to check three items: (1) computer with floppy drives only, (2) computer with hard drive, and (3) modem. Cross-tabulated responses indicate that 58 percent of the respondents (144 of 249; 4 missing cases) have a computer at home, and of these 68 percent (98 teachers, or 39 percent of valid cases) have computers with hard-disk drives at home. Finally, 16 percent of teachers (41) report having a modem at home, most configured with a machine with a hard disk drive.

For classroom resources, respondents were asked to check five items; the three above were repeated for the classroom

context and two others were added: the presence of a phone jack and accessibility within the classroom to a local area network. For the sake of comparability in this report, only information on the first three items will be provided. Cross-tabulation results indicate that 68 percent of the respondents (170 of 249) have a computer in the classroom, of whom 50 percent (85 teachers, or 34 of the full sample) have access in the classroom to computers with hard-disk drives. Twenty-two teachers (or 9 percent of the full sample) have access to a modem in their classroom; for all but one of these teachers the modem is configured with a hard-disk machine. Table 9 summarizes these results.

Table 9

Access to Computer Resources Among West Virginia Teachers
Percentage of Full Sample Reporting Access by Location

Resources	Location	
	Home	Classroom
computer (any sort)	57.8	68.3
computer (hard-disk drive)	39.4	34.1
modem	16.5	8.8

* Note: Cross-tabulations indicate that 15.3 percent of teachers (including those with modems) have access to a phone jack in the classroom.

Resource availability by level. Two dichotomous variables were created from data gathered about resource availability, HOMEUSE and CLASSUSE. If a respondent indicated no access to a computer or access only to a computer with floppy drives (and no hard drive), then the respondent was classified as a "user of low-end equipment." Use of a computer with hard-disk drive or a modem was warrant to classify the respondent as a "user of high-end equipment." HOMEUSE applied to resource availability at home, whereas CLASSUSE applied to resource availability in the classroom.

Chi-square analysis was done to determine if the number of users of high-end versus low-end equipment varied from expectancy by level. There were fewer users of high-end equipment in grades K-4 and more users of low-end equipment than might be expected on the basis of chance ($p < .05$). The opposite was true of teachers in grades 5-12 where there were more users of high-end equipment than chance would predict.

Preferred Learning Channels

Six items asked teachers to rate (5-point Likert scale, with "1" high) their preferences for the following channels through which to learn about telecommunications: (1) independent reading and practice, (2) workshops, (3) classroom consultants, (4) college courses, (5) help from colleagues, and (6) help from online trouble-shooters. Table 10 reports the percentages of respondents rating each item a "1" or "2" (highest ratings), the

percentage rating each item a "4" or "5" (lowest ratings), and the mean for each item.

Table 10

Respondents' Ratings of Six Learning Channels

Item	1 or 2 rating (percentage)	4 or 5 rating (percentage)	Mean Rating
colleagues	83.7	6.5	1.73
workshops	74.4	7.3	1.88
consultants	71.8	4.5	1.94
courses	56.3	16.3	2.43
online help	51.2	14.6	2.43
independent reading	46.5	22.1	2.56

Note: The highest rating is "1, and the lowest is "5."

Oneway analyses of variance were conducted (following tests for homogeneity of variance) on the item means of these six measures by level (grades K-4 versus grades 5-12 and grades 9-12 versus grades K-8) and, for teachers in grades 5-12 by subject field (math/science/technology versus not math/science/technology). No significant differences were found by either level grouping. The only significant difference ($p < .05$) by 5-12 subject groups concerned teachers' preferences for using independent reading and practice to learn about telecommunications. Math/science/technology teachers were less receptive to this method (mean of 2.1) than other 5-12 teachers (mean of 2.6)

Predictor Variables

Although inferential analysis of the data was not anticipated for this report, the researchers did perform a number of analyses relevant to predicting teacher preferences for telecommunications applications. These efforts, discussed briefly below, included comparison of means to determine if the four scale variables (COMPLIT, TELELIT, INSTRUCT, and PROFDEV) varied significantly by key demographic variables and correlational and regression analysis to account for variance in the key dependent variables (INSTRUCT and PROFDEV).

Analysis of variance. ANOVAs were computed for gender groups and instructional level groups (elementary versus not elementary) as well as for (1) high- versus low- home computer resource groups, (2) high- versus low- classroom computer resource groups, and (3) secondary subject groups

(math/science/technology versus not math/science/technology).

Both COMPLIT and TELELIT were shown to vary significantly by each of these grouping variables (with p between .000 and .040). INSTRUCT and PROFDEV showed fewer differences when grouped by these variables: INSTRUCT varied by "homeuse" groups and PROFDEV by both "homeuse" and "classuse groups." In almost all cases, comparisons favor the groups one might expect, and detailed results will not be reported here. However, between-group differences varied by as much as 3/4 standard deviation.

Correlational and regression analysis. The researchers also performed correlational and regression analyses in order to determine which variables might best predict INSTRUCT and PROFDEV. Correlational analysis indicated that the threat of multicollinearity was slight indeed (with no zero-order correlations so high as r=.45 and most about r=.15 or less), and the researchers adopted a three-block stepwise model for entry of variables. First, school-level background variables (school size and school computer resources) were requested; second, teacher-level background variables (personal computer resources, years teaching, and sex) were requested; and finally, measures of skill and attitude were requested (COMPLIT, TELELIT, and two derived variables related to teachers' view of the purpose of education). The resulting equations contained only significant variables and had highly significant F-values ($p < .00005$). Each equation accounted for approximately 20 percent of the variance in the dependent measure (INSTRUCT and PROFDEV). For INSTRUCT, years teaching and school size exerted a negative effect on the

dependent variable; for PROFDEV, only years teaching exerted a statistically significant negative effect.

Comparison of West Virginia Respondents with National Sample

Data presented in Honey and Henríquez (1993) provide an opportunity for some comparison of the average West Virginia teacher with a national group of teachers proficient in telecommunications. Table 11 makes these comparisons for selected background variables and also for application variables. With respect to the application variables, the comparison is between the percentage of West Virginia teachers who indicated that the application is "desirable" or "very desirable" and the national sample of proficient users actually using the listed application. The comparison perhaps suggests that the preferences of West Virginia teachers will predict their actual usage when telecommunications services become more accessible. But it may also suggest that nonusers overestimate the value of certain applications (e.g., access to mentors and experts) and underestimate the value of others (e.g., electronic mail).

Another possible point of interest is that these data suggest that many West Virginia teachers are ready, with modest support, to become proficient users of telecommunications. More than half the teachers who responded to this survey, for instance, have access to computers at home, and of these more than a third also have modems at home. As yet, however, fewer than four percent of respondents report that they are frequent users of any form of telecommunications service.

Table 11
Comparison of WV Survey Results (Average Teachers)
with National Survey Results (Accomplished Teachers)

	Background Data	
	WV (1993) [average teachers]	H&H (1993) [proficient teachers]
access to computer at home	58%	91%
access to modem at home	17%	73%
1-9 years teaching	16%	17%
10-20 years teaching	55%	47%
more than 20 years teaching	29%	36%

	Applications Preferences (WV) versus Usage (H&H)	
	WV (1993) [preferences]	H&H (1993) [actual usage]
student applications		
penpals	47%	41%
mentors/experts	55%	29%
publication	52%	45%*
databases	69%	57%**
professional development applications		
email	37%	76%
discussion groups	38%	47%
experts	50%	33%
libraries	52%	39%

Note: Preferences percentage for WV sample indicates percentage rating as "desirable" or "very desirable"; Honey and Henríquez percentage indicates percentage of accomplished teachers actually using the application.

* Combines two categories from Honey and Henríquez (story-writing exchanges and newspaper production).

** The highest usage rate for any information service or database listed in Honey and Henríquez as compared to WV teachers' preference for student access to information for class projects.

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APPENDIX A
Survey Instrument

Dear Teacher:

Across the nation, some educators have begun to discover that they can use electronic networks to benefit students and schools. But as yet, teachers in only a few states have access to such networks. The National Science Foundation is considering ways to help West Virginia teachers get network access. That's what the survey inside this booklet is all about. Very little is known about how most teachers regard computerized telecommunications. The most recently published national survey--the first of its kind--looked only at teachers who had become very active network users.

The West Virginia survey aims to develop the general picture, rather than focusing on such a special case. The idea is that, with accurate information provided in the survey, a West Virginia network will stand a much better chance of giving teachers what they want and need. Your expertise and your opinions are important to this effort.

Please take 10 minutes to share your views and your expertise. Just follow the simple instructions and use the self-addressed, stamped envelope for returning the completed survey. You may, of course, select to leave any item blank; but the more items you answer, the more we'll know about teachers' interests and needs.

If you'd like a report of the survey results and an ERIC Digest that describes the major noncommercial electronic networks, please write your name and address on the back cover of the booklet. We will, of course, guarantee confidentiality; we will report results as aggregate, not individual, data.

Sincerely,

Edwina Pendarvis

Aimee Howley

West Virginia Teachers'
Electronic Networking Survey

Part I: Demographics

A. PERSONAL

1. What is your gender?

[] female [] male

2. What is your age? _____

3. How many years have you taught school? ____

4. What level students do you teach most of your day?

[] K-4 [] 5-8 [] 9-12

5. If you are a middle or high school teacher, what subject do you teach during the largest part of your day? _____

B. SCHOOL AND COMMUNITY

6. Approximately how many students are enrolled in the school in which you teach? If you do not know the exact number, please estimate. _____

7. How would you describe the socio-economic status of the community (or neighborhood) in which you teach?

[] high [] middle [] low

8. If there is anything else you want to say about your school or community, please add it below.

Part II: Knowledge

In this section, please use the following five-point scale to rate your overall familiarity (not just at school) with the listed items (section A), functions (section B), and networks (section C):

1 = no awareness, no use
2 = some awareness, no use
3 = some use with assistance
4 = some independent use
5 = frequent independent use

A. By circling the appropriate number, please rate the level of your familiarity with the following things that make up computer systems:

1. microcomputer	1 2 3 4 5
2. mainframe or mini-computer	1 2 3 4 5
3. modem	1 2 3 4 5
4. CD-ROM drive	1 2 3 4 5
5. ANY of the various programming languages	1 2 3 4 5

B. By circling the appropriate number, please rate the level of your familiarity with the following functions performed by computers:

1. wordprocessing	1 2 3 4 5
2. databases or spreadsheets	1 2 3 4 5
3. statistical analysis	1 2 3 4 5
4. instruction	1 2 3 4 5
5. accounting	1 2 3 4 5
6. desktop publishing	1 2 3 4 5
7. computer-assisted design (CAD)	1 2 3 4 5

C. By circling the appropriate number, please rate the level of your familiarity with the following telecommunications networks:

1.	Internet or Bitnet	1	2	3	4	5
2.	commercial services (e.g., (Prodigy, Compuserve)	1	2	3	4	5
3.	specialized bulletin board systems	1	2	3	4	5

Part III: Technological Preferences

A. Please indicate your preferences for the following **professional development activities** by using this scale:

0 = don't know enough to have an opinion
1 = not acceptable
2 = not desirable
3 = acceptable
4 = desirable
5 = very desirable

1.	sending and receiving messages electronically with colleagues throughout the world	0	1	2	3	4	5
2.	consulting with experts and scholars	0	1	2	3	4	5
3.	searching electronic catalogues of libraries around the world	0	1	2	3	4	5
4.	searching the ERIC data-base electronically	0	1	2	3	4	5
5.	engaging electronically in on-going discussions on topics of interest	0	1	2	3	4	5
6.	receiving electronic journals or newsletters	0	1	2	3	4	5
7.	receiving text-based materials on-line (e.g., books, lesson plans, reports)	[illegible]	1	2	3	4	5
8.	receiving nonprint media on-line (e.g., software, photographic images, digitized sound)	0	1	2	3	4	5
9.	participating in formal professional development opportunities (e.g., electronic conferences and courses) on-line	0	1	2	3	4	5

B. Please indicate your preferences for the following **instructional activities** by using the same scale as you used above in Part A:

1.	establishing pen-pal exchanges among students	0 1 2 3 4 5
2.	engaging your students in collaborative projects with students in remote sites	0 1 2 3 4 5
3.	helping students find information for class projects	0 1 2 3 4 5
4.	giving students access to remote computers for data analysis or simulations	0 1 2 3 4 5
5.	connecting your students with "real" mathematicians and scientists (mentors)	0 1 2 3 4 5
6.	encouraging your students to participate in on-going student discussion groups	0 1 2 3 4 5
7.	publishing results of student projects	0 1 2 3 4 5
8.	providing ways for students to voice their opinions (e.g., letters to congressmen)	0 1 2 3 4 5

Part IV: Attitudes

A. Rank the following 8 educational purposes by placing a "1" next to the purpose that you think is MOST IMPORTANT, a "2" next to the one that is the next most important, and so on. A ranking of "8" will mean that the purpose is LEAST IMPORTANT to you. Use each number (1 to 8) ONLY ONCE.

____ making U.S. students first in the world in math and science achievement

____ helping students think mathematically and scientifically

____ improving the mathematics and science achievement of disadvantaged groups

____ ensuring mastery of the basic facts of math and science

____ increasing students' technological literacy

____ encouraging students to think critically

____ providing students with better career opportunities

____ involving students in activities that make the world a better place

Part V: Hardware Accessibility

Check which equipment you have access to AT HOME:

[] computer with floppy drive(s) only
[] computer with floppy drives AND internal hard drive
[] modem

Check which equipment you have access to IN YOUR CLASSROOM:

[] computer with floppy drive(s) only
[] computer with floppy drives AND internal hard drive
[] phone jack
[] modem
[] local area network

Check which equipment you have access to ELSEWHERE IN YOUR SCHOOL (outside your classroom):

[] computer with floppy drive(s) only
[] computer with floppy drives AND internal hard drive
[] modem
[] local area network
[] microcomputer lab

Part VI: Learning Preferences

A. How do you rate the following methods for learning about new technologies?

	Very Useful				Not Useful at All
1. independent reading and practice	1	2	3	4	5
2. workshops or conferences	1	2	3	4	5
3. classroom consultants	1	2	3	4	5
4. college courses	1	2	3	4	5
5. assistance from colleagues	1	2	3	4	5
6. assistance from on-line (e.g., phone or computer) troubleshooters	1	2	3	4	5

Part VII: Comments

A. What else do you want to tell us about your interests in and need for telecommunications?

IF YOU WOULD LIKE TO RECEIVE A COPY OF THE SURVEY RESULTS AND AN ERIC DIGEST THAT DESCRIBES THE MAJOR NONCOMMERCIAL ELECTRONIC NETWORKS, PLEASE INCLUDE YOUR NAME AND ADDRESS BELOW. Remember we will not associate your name or other personal information with your responses to this survey.